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Reaction of 5-oxo-2-phenyl-4,4-bis(trifluoromethy-)-4,5-dihydro-1,3,2- benzodioxaphosphepine with chloral. the synthesis and spatial structure of 5-carbaphosphatrane containing a four-membered ring

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Abstract

Phosphorylation of 2-hydroxyphenyl 2,2,2-trifluoro-1-hydroxy-1- (trifluoromethyl)ethyl ketone with dichloro(phenyl)phosphine gave 5-oxo-2-phenyl-4,4-bis(trifluoromethyl)-4,5-di-hydro-1,3,2-benzodioxaphosphepine. Heating of the latter initiated an intramolecular interaction of the P atom with the carbonyl group. Hydrolysis of the intermediate product yielded 3-hydroxy-2--xo-2-phenyl-3-[2,2,2-trifluoro-1- hydroxy-1-(trifluoromethyl)ethyl]-2,3-di-hydro-1,2λ5-benzo[d] oxaphosphole. The reaction was highly stereoselective (PRC S/PSCR). The reaction of the starting phosphepine with chloral proceeded highly stereoselectively (PRC SCS/PSCRCR) to give a 5-carbaphosphatrane derivative containing a four-membered ring, namely, 1-phenyl-3-trichloromethyl-10,10-bis(trifluoromethyl)-6,7-benzo-2,4,8, 9-tetraoxa-1-5-phosphatricyclo[3.3.2.01, 5]decene. The trigonal bipyramid of the 5-carbaphosphatrane derivative is made up of the equatorial O atoms and the apical C atoms. © 2010 Springer Science+Business Media, Inc.

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Keywords

apicophilicity, benzophosphole, carbaphosphatrane, chloral, dioxaphosphepine, oxaphosphetane, phosphorane, stereoselectivity, trigonal bipyramid